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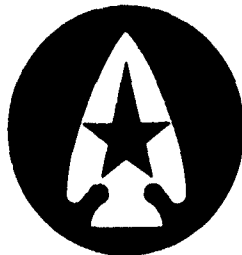
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**UNITED STATES ARMY
COMBAT DEVELOPMENTS COMMAND
OPERATIONAL REPORT - LESSONS LEARNED
QUARTERLY REPORT**



SEP 22 1969



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DEPARTMENT OF THE ARMY
HEADQUARTERS
UNITED STATES ARMY COMBAT DEVELOPMENTS COMMAND
FORT BELVOIR, VIRGINIA 22060

CDCRE-T

24 JUL 1969

SUBJECT: Operational Reports - Lessons Learned

SEE DISTRIBUTION

1. References:

a. Paragraph 5b, Army Regulation 525-15, Operational Reports - Lessons Learned, 26 January 1968.

b. USACDC Regulation 71-13, Lessons Learned, 9 January 1967.


2. Attached are copies of the May 1969 USACDC report to Department of the Army of the status of evaluation of Operational Reports - Lessons Learned.

3. Request each addressee review the report to determine if actions contemplated by other addressees require supportive action in areas for which they have proponentcy. Actions so taken will be reported under the provisions of reference 1b, as part of the Lessons Learned Program.

4. The report to Department of the Army is considered to be informational only. Actions required to complete needed changes to doctrine, materiel, or organizations must be undertaken separately. Further, inclusion of an item in the report does not preclude reconsideration of a contemplated action if new information or further review warrants such reconsideration.

FOR THE COMMANDER:

1 Incl
as


DALE A. KEENAN
CPT, AGC
ASST AG

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DEPARTMENT OF THE ARMY
HEADQUARTERS
UNITED STATES ARMY COMBAT DEVELOPMENTS COMMAND
FORT BELVOIR, VIRGINIA 22060

CDCKE-T

25 JUL 1968

SUBJECT: Operational Reports - Lessons Learned

Assistant Chief of Staff
for Force Development
Department of the Army
Washington, D. C. 20310

1. Reference Army Regulation 525-15, Operational Reports - Lessons Learned, 26 January 1968.

2. In accordance with paragraph 5b, reference above, a review has been conducted by the US Army Combat Developments Command (USACDC) of those Operational Reports - Lessons Learned that have been received since the last submission. A listing of the reports reviewed and comments thereon are attached as follows:

a. Inclosure 1: Comments on items considered to warrant action and the status of those actions.

b. Inclosure 2: Comments on items that appear valid but which require further study.

c. Inclosure 3: Comments on items which are considered to warrant appropriate actions by commands other than USACDC.

d. Inclosure 4: Glossary of terms.

3. In addition to the specific comments included in Inclosures 1 through 3, the following general comments are offered:

a. Reports reviewed in previous quarters are being retained and reviewed in conjunction with those reports recently received.

b. The statement that certain material will be included in future changes or revisions of field manuals or other publications should not be construed as meaning verbatim inclusion as written

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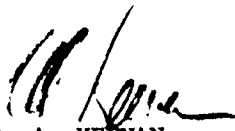
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in this report, nor should it be construed to mean that new material will be used only in those publications mentioned in the report. The inclosed comments convey the general intent; the precise wording and location of material in manuals or other publications will be determined in each case as a separate action.

FOR THE COMMANDER:

4 Incl
as (30 cys)



D. A. KEENAN
Captain, AGC
Asst AG

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1. (U) Reference: Operational Report - Lessons Learned, 222d Combat Support Aviation Battalion, 31 July 1968.

2. (U) Item: Aerial Delivery Slings.

3. (U) Unit Comments:

a. Slings are usually in short supply. Requests have been received for this organization to furnish slings and to rig loads for various missions. Some slings are nonexpendable property, making it quite difficult to keep track of organizational slings when they are utilized on operational missions. Recommend that aerial delivery slings be classified expendable since recommended useable life is six months. This would also facilitate placing orders for these items, and insure more timely receipt.

b. Other Headquarters' Comments: 1st Aviator Brigade. This headquarters concurred in and forwarded the request from the 222d Cbt Spt Avn Bn recommending the subject slings be classified as expendable. The reply from USARV, 3d Ind, AVHGD-SM, subject: Slings, Cargo Aerial Delivery, dated 10 August 1968, states it is the responsibility of the transported commander to furnish cargo slings, cargo bags and related items. A USARV Standard Basis of Issue (BOI) is currently being developed authorizing adequate slings to US units. The 4th Ind to basic correspondence forwarded this information thru the 12th Combat Aviation Group to the 222d Combat Support Aviation Battalion.

4. (U) USACDC Discussion: This has been a recurring problem. AMC has been faced with the problem of supplying the user with a sufficient number of aerial delivery slings in RVN.

5. (U) USACDC Action: Aerial delivery slings are now issued as expendable items as a result of a Basis of Issue Plan (BOIP) which was requested by USACDC.

1. (U) Reference: Operational Report - Lessons Learned, 222d Combat Support Aviation Battalion, 31 July 1968.
2. (U) Item: Wind Vibration of Nylon Slings at High Airspeeds.
3. (U) Unit Comments: Such vibration causes nylon straps to become overheated. When nylon becomes too hot it will begin to melt, and this has been experienced when a moving aircraft causes such vibration. Under these circumstances the nylon will not approach the point of melting apart, but the strands of fiber weaken sufficiently to reduce the load-carrying capacity of the slings. The problem can be alleviated by placing one twist in the sling for every three feet of sling.
4. (U) USACDC Discussion: Vibration problems causing sling failures during external helicopter operations is a problem of long standing. This report adds further emphasis to the seriousness of the problem.
5. (U) USACDC Action: A draft proposed SDR being prepared by USACDC for a new family of slings will incorporate characteristics to correct this problem.

1. (U) Reference: Operational Report - Lessons Learned, 222d Combat Support Aviation Battalion, 31 July 1968.

2. (U) Item: Transporting Lumber, PSP, and Barbed Wire by Sling Load.

3. (U) Unit Comments: Transporting the above items with nylon slings or rope cargo nets is an unsafe practice. These three items have a tendency to cut through nylon and rope in a very short period of time, causing the load to be dropped. Rigging these loads can be done safely with the use of a cable, the ends of which can be unraveled and spliced together by reraveling and clamping the splice, thereby forming a loop which is as strong as the rest of the cable.

4. (U) USACDC Discussion: The problem of transporting lumber, PSP, and barbed wire by sling load will be considered in a small development requirement (SDR) for a new family of external helicopter slings. The problem will be identified in the SDR as an essential characteristic.

5. (U) USACDC Action: A draft proposed SDR for a new family of slings will incorporate characteristics to correct this problem.

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1. (U) Reference: Letter, Command Summary - Debriefings of Returnees from Vietnam, HQ USACDC, 29 October 1968. (Page 19)
2. (U) Item: Aircrewman's Protective Armor.
3. (FOUO) Individual's Comments (Summary): Individual recommends the improvement of aircrewman's armor protection devices. Suggestions include extending the chest protector 2 or 3 inches on each side to protect the body area under the armpit, using a device to improve protection of crewchief and gunner, adding armor plate on the floor of the aircraft, and adding an absorptive material on the chest protector to prevent a deflected round from fragmenting.
4. (FOUO) USACDC Discussion: New chest protectors have been designed with a curved portion at the lower edge, an extended projection on each side (1½ to 2 inches), and an improved carrier that will absorb secondary fragments. Armor plating the aircraft floor is not practical at this time due to degraded aircraft performance caused by the added weight of armor.
5. (U) USACDC Action: A QMDO for development of lightweight ballistic materials, processed by USACDC and approved by DA on 3 March 69, has been sent out for field review. With development of this new material, it may be feasible to provide added protection to the floor of the aircraft.

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1. (U) Reference: Operational Report - Lessons Learned, 16th Combat Aviation Group, 31 July 1968.
2. (U) Item: Ballistic Helmets.
3. (U) Unit Comments (Summary): The greatest problem with the ballistic helmet in Vietnam stems from the discomfort to the wearer as a result of the apparent smallness in size compared to a similar size in the APH-5. Consequently, many crew members do not wear the ballistic helmet. It has been learned, however, that the helmet's wearability and fit can be improved with no decrease in protection by making individual modifications such as cutting out a semicircle in the polystyrene and by removing a coil or two of the earphone spring.
4. (U) USACDC Discussion: This report is one of many critical reports about the AFH-1 helmet. A new helmet (SPH-4) has been developed that will provide improved sound attenuation, restraint system which prevents helmet loss if the head is thrown forward in an accident, improved pilot comfort and reduction in weight over the present model being issued.
5. (U) USACDC Action: A Letter Requirement - Quick Reaction (LR-QR) was submitted for a new aircrewman's protective helmet on 10 January 1969. The LR-QR is presently being staffed at DA level. Upon approval of this LR-QR and successful testing, the SPH-4 will replace both the AFH-1 and APH-5. USACDC will continue to monitor current actions on aircrewmen protective headgear.

1. (U) Reference: Operational Report - Lessons Learned, 223d Combat Support Aviation Battalion, 31 July 1968.
2. (U) Item: Shoulder Weapon for Aircrew Members.
3. (U) Unit Comments: Aircrew members consider a shoulder fired weapon to be mandatory for personal defense in an emergency situation. The CAR-15 is light weight, compact, and is the weapon most preferred by aircrew members. Recommend that the CAR-15 be authorized for issue to all aircrew members in addition to the pistol presently authorized.
4. (U) USACDC Discussion: AR 310-34 authorizes the .38 caliber revolver for all aircrew members. Concurrently with actions to authorize shoulder fired weapons, a requirement for a device to secure the weapon in the aircraft should be developed and fielded. Current lack of such a device causes loss of weapons while in flight and also discourages carrying of such weapons by crewmembers while in flight.
5. (U) USACDC Action: This subject will be addressed in future debriefings of air cavalry personnel. Field notification of impending revision of air cavalry TOE's will invite comments concerning the addition of a shoulder fired weapon for authorization in air cavalry TOE.

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1. (U) Reference: Operational Report - Lessons Learned, 13th Combat Aviation Battalion, 31 July 1968.

2. (U) Item: Flare Ship Operation.

3. (U) Unit Comments (Summary): During MK-24 flare operations employing the UH-1D there is no protection for the pilot against smoke and blinding light resulting from premature ignition of a flare in the cabin nor is there an expeditious means to jettison flares in an emergency situation. A possible solution to the first of these potentially hazardous conditions would be to drape an asbestos curtain between the cockpit and cabin area. The second condition could be rectified by placing one half of a modified 50 gallon drum on each side of the aircraft for the purpose of storing flares while in flight. This assembly, attached to the skid so that it could pivot around the skid and be secured to the aircraft by means of a quick release safety belt, provides a quick jettison system should a malfunction occur with one or more of the flares.

4. (C) USACDC Discussion: USACDC recognizes the hazards associated with dropping the MK-24 flares manually from helicopters and recommends the following procedures be adopted when conducting flare operations:

a. When dropping flares manually from helicopters the fuze lanyard should be attached to a 4 foot static line which is secured to a tiedown ring aboard the helicopter. When the flare is dropped the static line will permit activation of the fuse when the flare reaches a point 4 feet below the aircraft.

b. Personnel dropping the flares should be secured within the aircraft by a safety strap.

c. It is prohibited to pull the lanyard to activate the flare fuse inside the aircraft regardless of the amount of time set on the fuse.

The MK-24 flare may soon be replaced with the MK-45 flare and flare dispenser, XM-19. Manual flare dropping will be eliminated when this occurs. Longer range plans call for development of the XM-170 flare and XM-18 dispenser for use on Army helicopters.

5. (U) USACDC Action: USACDC will continue to monitor developments in flare dispensing systems. A copy of this item has been sent to Picatinny Arsenal, Dover, New Jersey, ATTN: SMUPA-KI for appropriate action and a recommendation was made to the Aviation School that safety precautions listed in paragraph 4 be incorporated in the next change or revision of FM 1-105.

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1. (U) Reference: Trip Report (6-69) on Fire Ball Mission, USACDC Liaison Detachment, USARV, 15 January 1969.

2. (U) Item: Fire Ball Mission .

3. (C) Unit Comments (Summary): A Fire Ball Mission is an attack on a target using a sling load of 55 gallon drums filled with gasoline and thickener which is transported to the target by CH-47. Division chemical personnel are responsible for the conduct of the Fire Ball Missions.

a. The load consisted of 20 55-gallon drums held as a sling load by a 20,000 pound capacity net. The cargo net is a US Navy piece of equipment. Two cargo nets were obtained which allows the ground crew to prepare a load while the helicopter is working a mission. Ten drums contain 4% thickener which provides longer burning duration. The other ten drums contain 1% thickener which allows greater ease in ignition, and spread of the fuel.

b. A minimum of four chemical section personnel accompany a mission of this type, an OIC, Assistant OIC, NCOIC and one enlisted man. One man is required on the ground as hook-up man to rig the sling load to the aircraft. A few minutes prior to the drop, chemical personnel position themselves about the open hatch with two thermite grenades per man (on this mission three men were at the hatch opening). The pins are pulled on signal and as one side of the cargo net is released allowing the drums to fall the grenades are dropped through the hatch opening. The OIC maintains communications with the aircraft crew, FAC, and friendly troops in the vicinity.

c. Missions are flown at altitudes from 500 to 5000 feet. Altitude is dictated by the tactical situation, i.e. friendly troop location, size of the target, desired results, terrain and enemy. Greater dispersion with slightly less accuracy has been realized with increased altitude.

d. Thermite grenades are normally employed for ignition. Other means may be utilized. A drop close to friendly troops may preclude ignition of the mixture until clearance is received from the ground commander. If the thermite grenades fail to ignite the mixture friendly troops may ignite the solution on the ground. If no friendly troops are in the area of the drop and thermite grenades fail to ignite the mixture, tracer ammunition fired by the door gunners may suffice. Gunships may be used to ignite the target area or a WP round from a FAC aircraft may be used.

e. The Fire Ball Mission may be used to attack and clear booby trap areas, mortar/rocket positions, cultivated areas and

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troop concentrations. Fire Ball Missions in the past have supported troops in contact and have been dropped on caves with successful results.

f. The 10th Chemical Platoon provides direct support to the 101st Airborne Division (Amb1) on the Fire Ball Mission. Platoon personnel operate the Service Unit M4A2 mixing equipment that prepares the drums for such drops. The platoon is organized under TOE 3-7E. The 10th Chemical Platoon is organized as an organic platoon of a chemical company working without administrative and logistical support normally realized from the company headquarters element. Consideration should be given to providing augmentation to the platoon.

4. (C) USACDC Discussion:

a. The use of Army aircraft in this type of operation is not recommended when TAC AIR is available. TAC AIR has the mission and capability to accurately provide flame support with far lower risk. To accurately deliver the flame fuel load, when friendly troops are in the vicinity, a Chinook must hover over the target area at low altitudes. Hostile ground fire imposes a hazard to the aircraft in this situation. Another serious limitation on the Chinook involves air speed. The aircraft cannot travel at speeds greater than 20 knots when the flame fuel drums are released. As a result, the empty cargo sling may lash back, seriously damaging the aft rotor system and aircraft. Preplanned missions requiring a flame fuel drop should be requested from TAC AIR. Immediate strikes should be requested from Army air only when TAC AIR cannot respond on an immediate basis. Considering the safety hazards involved, the employment of the cargo net in flame drops should be further evaluated before this technique is incorporated into publications.

b. USACDC has developed Team PA, Chemical Combat Support, TOE 3-500, for the purpose of performing the many chemical oriented missions which have evolved from operations in Vietnam. Team PA includes some administrative and logistical support personnel but still will be dependent upon others for mess, finance, personnel, medical, and similar services as is customary for team-type organizations. Team PA is designed to replace the chemical platoons which are organized under TOE 3-7E. Department of the Army has approved Team PA for publication.

5. (U) USACDC Action: Team PA was developed by USACDC to provide support to units using special purpose weapons, (i.e. Fire Ball Missions). The techniques employed in Fire Ball Missions are being evaluated by USACDC.

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1. (U) Reference: Operational Report - Lessons Learned, 4th Infantry Division, 31 July 1967.
2. (U) Item: Gunship Support.
3. (U) Unit Comments: Frequently gunships are called to an area of contact, but are not used because of the presence of other fire support means. One solution is to give the gunships a separate mission and area of operations.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: FM 61-100, The Division, which is scheduled for publication in FY 69, contains a paragraph in Chapter 4 which states that "The development of this plan" (Division Fire Support Plan) "includes the preparation and integration of the artillery fire plan, chemical fire plan, naval gunfire, air fire plan, and armed helicopter fire plan." Additionally, in Chapter 6 of the manual it is stated that "Close air support aircraft and armed helicopters inflict maximum damage by attacking enemy reserves and withdrawing enemy columns."

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1. (U) Reference: Operational Report - Lessons Learned, 145th Combat Aviation Battalion, 30 April 1968.
2. (U) Item: Burned-Out Landing Zones.
3. (C) Unit Comments (Summary): During the dry season, air mission and ground unit commanders should pay particular attention to burned out areas and avoid landing in them whenever possible. Numerous instances have been observed in which landings for both insertion and extraction of troops have been made into areas that have been recently burned. These areas are thick with dust and ashes and the possibility of encountering instrument conditions is present. Often a more suitable landing area can be located nearby.
4. (C) USACDC Discussion: The danger of dust restricting visibility is a very real possibility in airmobile operations. In addition to aircraft limitations, dust encountered by troops landed in a burned area may significantly reduce their capability to accomplish the mission.
5. (U) USACDC Action: This item has been incorporated into the revised edition of FM 1-100.

1. (U) Reference: DA Pamphlet 525-5 Military Operations - Lessons Learned - Dust Control, February 1969.
2. (U) Item: Dust Control.
3. (U) Unit Comments: This pamphlet is a summary of military engineering lessons learned as derived from operational reports which have been submitted by engineering units conducting operations in Vietnam and elsewhere. This pamphlet is devoted exclusively to the subject of emergency dust-control operations and provides the necessary evaluation and selection techniques leading to the most effective dust-control measures for the wide range of problem areas. Interim solutions to the problem of dust control have been jointly developed in the field and at testing sites in the CONUS as reported from the ongoing CONUS developmental and testing activities including US Army Engineer Waterways Experiment Station and USAMERDC.
4. (U) USACDC Discussion: The engineer lessons learned in dust control points up an aspect of the role of engineers in controlling or improving the environment in which military operations are to be conducted. The impact of environment on airmobile operations indicates a need for greater doctrinal emphasis on the role of combat engineer units in dust control.
5. (U) USACDC Action: This item will be incorporated into future changes and revisions of proponent field manuals.

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1. (U) Reference: Operational Report - Lessons Learned, 1st Cavalry Division (Airmobile) Artillery, 31 July 1968.
2. (U) Item: Standardization Training for ARA Aviators.
3. (C) Unit Comments: Most newly assigned aviators are directly assigned from flight school and require considerable additional training prior to release on combat missions. Newly assigned aviators on their first aviation tour assigned to ARA are weak on in-flight emergency procedures and require additional training prior to release for combat missions. These individuals also must be trained in rocket gunnery and artillery tactics and procedures. The shortcomings of new aviators and a list of recommended areas to stress in flight school has been provided the Director of Instruction, US Army Aviation School.
4. (U) USACDC Discussion: Training for employment of armed helicopters, including aerial artillery, is centered in Vietnam; potential of the elaborate training base in the US is virtually unused. High on the priority for weapons systems should be a training base of COBRA and CHEYENNE weapons systems for assignment to Fort Sill. USACDC is presently revising FM 6-102, Field Artillery Battalion Aerial Artillery, and final publication is scheduled for 1st Qtr FY 70.
5. (U) USACDC Action: Future actions concerning the CHEYENNE system will note this requirement for a training base. Recommend that CONARC take action to update Programs of Instruction to include more intensive training on in-flight emergency procedures and aerial artillery doctrine. Also recommend that CONARC update POI's of all officer and OCS classes to include doctrine contained in the revised FM 6-102.

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1. (U) Reference: Operational Report - Lessons Learned, 4th Infantry Division Artillery, 31 July 1968.
2. (U) Item: Employment of Artillery, Tactical Air, and Gunships.
3. (C) Unit Comments (Summary): It is frequently an advantage to attack a target with all available firepower without the check fire of one of the fire support elements. This requires coordination and an understanding of what is required of the artillery, tactical air, and gunships. The artillery should be adjusted first as it is the most responsive fire support means available. The availability of fire support means should be assessed and a coordinated plan developed. In conjunction with rapid employment of aerial ordnance, the artillery should be oriented on routes of departure, avenues of approach, and assembly areas. If this reorientation is impossible to achieve with split-second timing because of terrain or other overriding factors, the elements of the artillery should be check-fired as ordnance is delivered. After the airstrike, while artillery works the outlying areas, gunships may be employed to make their suppressive run on the target area. Following the use of gunships and after the infantry battalion commander has assessed the effect of all fire support means and made his final judgment, artillery can be brought back into the target area.
4. (C) USACDC Discussion: The above evaluation points out that, if the ground commander is to employ all available firepower at a given time and place, he must ensure thorough coordination between the elements that provide firepower. Firepower may be provided by organic infantry mortars and other weapons, USAF tactical air, Army aviation, and artillery. Each element can make its full contribution only if it understands just which targets it is to attack, at what time, and has assurance that it can operate with minimum danger to or from other friendly forces.
5. (U) USACDC Action: This item has been incorporated into the initial draft manuscript of the revised FM 1-100.

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1. (U) Reference: ACTIV Final Report - CS Munitions: Launcher and 35mm Cartridges: Tactical CS, 16 tube E8, United States Army Vietnam, 6 November 1968.

2. (U) Item: CS Munitions - E8 Launcher.

3. (C) Unit Comments (Summary): The E8 Launcher was effective when used in the attack of hard targets, a retrograde action, and in the defense of static positions. The full potential of the munition was not realized because the launcher was not actually employed in other roles such as ambush and counterambush situations, and attack of mixed population targets. The published doctrine and techniques for employing the E8 Launcher in RVN are adequate but the weapon should also be considered for employment in other roles such as those recommended in TC 3-16. The weight of the E8 Launcher is excessive. Prior to type classification, engineering studies should be performed to reduce the launcher's weight and increase its range. Vietnamese language instruction decals and manuals are required in addition to information on power sources available for firing the launcher electrically. Vietnamese military personnel require training on the employment of the E8 Launcher. Also, US combat troops should have CONUS training on the employment of the weapon.

4. (C) USACDC Discussion: The E8 Tactical CS Launcher has been type classified limited production (LP). USAMC is conducting feasibility studies in reducing the weight.

5. (C) USACDC Action:

a. USACDC has proposed SDR's for a Vehicular Mounted/Ground Employed Tactical CS Launcher and a Manportable Tactical CS Launcher which will provide an increased range that is not presently available with the E8.

b. USACDC will continue to monitor engineering developments on this item.

c. In addition, it is recommended that this item be brought to the attention of USCONARC for incorporation into training programs, as appropriate.

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1. (U) Reference: Operational Report - Lessons Learned, 145th Combat Aviation Battalion, 30 April 1968.
2. (U) Item: Use of CS Agents During Airmobile Operations.
3. (C) Unit Comments: During a recent combat assault mission near Dong Tam the 68th Assault Helicopter Company dropped CS in support of a ground unit. The enemy held the junction of two perpendicular tree lines in force and were defending from bunkers, some of which had defied TAC AIR, artillery, and gunship attack. In an attempt to rout the enemy CS gas was dropped on the positions. When the agent was employed the enemy left their positions and were killed by the ground force. All too often during airmobile operations enemy bunkers near a LZ are not neutralized by preparatory or suppressive fire. CS gas should be made available and be employed against enemy in fortified positions. It can be employed in conjunction with smoke by either smoke dispensing or armed helicopters.
4. (C) USACDC Discussion: The cited concept of employment of CS during airmobile operations appears sound and could be instrumental in reducing friendly casualties. Helicopter pilots should wear protective masks when employing CS.
5. (U) USACDC Action: USACDC will continue to monitor such information for incorporation into FM 1-100.

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1. (U) Reference: Trip Report (8-69), Convoy Security, USACDC Liaison Detachment, USARV, 20 January 1969.
2. (U) Item: Convoy Security.
3. (U) Unit Comments (Summary): The report prescribes guidelines for the planning and movement of critical supplies by truck convoy, from port facilities and logistical complexes to forward supply areas during the hours of darkness.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: This item is incorporated in the final draft of FM 55-30 which supersedes current FM 55-35 and FM 55-35-1 (Test). CDC has forwarded a copy of this trip report to the USATSCH for their information.

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1. (U) References:

a. Operational Report - Lessons Learned, 25th Infantry Division, 31 July 1968.

b. Operational Report - Lessons Learned, 35th Combat Engineer Battalion, 30 April 1968.

2. (U) Item: Road Clearing and Security Missions.

3. (C) Unit Comments: A great number of techniques and varied approaches must be employed in opening and maintaining security along main roads. Stereotyped operations allow the enemy to anticipate friendly actions and thereby successfully interdict friendly operations. Units involved in road clearing and security missions should apply the following recommended techniques:

a. Use scout dogs with the infantry security element to secure mine sweep teams during night sweeps.

b. Employ sniper teams during night and daylight hours at those critical locations where mining and road block incidents occur most frequently.

c. Provide an award/incentive program for those who find mines along the road.

d. Utilize drop off ambush patrols at critical areas while moving along the road in a night sweep.

e. Be attentive to organization, rest and motivation of mine sweep teams accompanying the tactical unit. Utilize security personnel in OJT with the engineer sweep personnel. This practice allows engineer personnel relief during sweep operations and enables security personnel to become proficient in using mine detectors.

4. (C) USACDC Discussion: While doctrinal publications provide most of the essential information for route clearing during stability operations, several salient features of the above item could be included specifically: conducting sweeps under reduced visibility conditions, use of sniper teams, ambush patrols and alternating operator personnel.

5. (U) USACDC Action: This item will be considered for incorporation into FM 20-32. The substance of this item will be incorporated in the next scheduled revision of FM 7-15.

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1. (U) Reference: Operational Report - Lessons Learned, 16th Military Police Group, 31 October 1967.

2. (U) Item: Port Security.

3. (C) Unit Comments: Military police have the mission of providing waterborne security of port and inland harbor facilities. Military police and transportation personnel work together aboard patrol craft. There is a requirement to coordinate operations through the U.S. Navy element which is also involved in waterborne security operations. Basic doctrine for waterborne security operations is inadequate.

4. (U) USACDC Discussion: There appears to be a requirement for joint service consideration and a specific delineation of service proponentcy.

5. (U) USACDC Action: USACDC has provided the Army input for a manual, "Doctrine for Joint Riverine Operations," being compiled by the Joint Chiefs of Staff. The manuscript for this manual is currently being reviewed by USACDC for comment to JCS.

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1. (U) Reference: Senior Officer Debrief Report, LTG Fred C. Weyand, former Commanding General, II Field Force, Vietnam, 4 October 1968.
2. (U) Item: Modification of TOE.
3. (C) Individual's Comments: The limited war situation in Vietnam has required modification of some TOEs. Consideration should be given to permanently modifying Army organizations in response to the requirements peculiar to typical counterinsurgency environments.
4. (C) USACDC Discussion:
 - a. The Army-75 doctrinal study program considers low intensity warfare. Possible TOE modifications may evolve from the synthesis of Army-75.
 - b. The Army-85 Concept Study addresses low intensity warfare. The Army-85 doctrinal study program will examine low intensity warfare in detail to determine doctrinal and organizational concepts best suited for this type of conflict. Revisions of TOE's will be one of the final results of the Army-85 doctrinal study program.
5. (U) USACDC Action: This item will be addressed in the Army-85 doctrinal study program.

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1. (U) Reference: Operational Report - Lessons Learned, 6th Transportation Battalion (Truck), 31 October 1968.

2. (U) Item: Driver/Vehicle Productivity.

3. (U) Unit Comments:

a. Average load performance of the 2½-ton cargo truck and 5-ton cargo truck ranges from 2.5 to 4 tons per truck and 3 to 7 tons per truck respectively. As an indication of the number of these low cargo carrying capacity trucks required to transport a given amount of tonnage, 68 2½-ton cargo trucks were utilized to move 243 tons of cargo and 536 5-ton cargo trucks were utilized to move 3,490 tons of cargo in the line haul system during the month of September 1968. Actual average load performance of the 2½ and 5 ton cargo trucks employed in the line haul system for that month was 3.6 and 6.5 tons per vehicle trip respectively. On 21 August 1968, a 5-ton cargo truck with dolly converter and semitrailer attached (the composite vehicle) was employed on its first cargo carrying mission. Initial feasibility tests and subsequent operational field tests of the composite vehicle on port and beach, local haul, and line haul missions were very successful. Results of a complete test and evaluation project indicate that utilization of the composite vehicle is mechanically and operationally feasible within this organization's motor transport area of operations in the III and IV Corps Zone, Republic of Vietnam. The economical advantages of composite vehicle utilization are clearly demonstrated in a comparison of vehicle average load performance. During the month of September 1968, 158 trips with the composite vehicle resulted in the line haul movement of 2,852 tons of cargo. Average payload performance of the composite vehicle for the period was 18.0 tons per vehicle trip as opposed to the 3.6 and 6.5 tons per vehicle trip for the 2½-ton and 5-ton cargo trucks. Based on average load performance, composite vehicle utilization in lieu of 2½ and 5-ton cargo truck utilization results in a direct driver and vehicle savings of 4 drivers and 4 2½-ton trucks or 2 drivers and 2 5-ton trucks per 18 tons of cargo transported. Results of the composite vehicle test and evaluation project indicates that the addition of 20 dolly converters and 40 semitrailers to the TOE of the Transportation Company (Light Truck - 5-ton), would increase the unit's movement capability by an amount equal to the addition of two complete platoons. It is recommended that MTOE requesting authorization approval of the addition of 20 dolly converters and 40 semitrailers for each of the three transportation companies (Light Truck - 5-ton) attached to this organization be approved.

b. Other Headquarters' Comments: 1st Logistical Command. The use of dolly converters and semitrailers attached to 5-ton cargo trucks greatly increase the lift capability of the light truck

company (5-ton). The MTOE for addition of 20 dolly converters and 40 semitrailers should be approved.

4. (U) USACDC Discussion: The unit reports on the results of a test whereby 5-ton trucks towed semitrailers equipped with dolly converters. The two-vehicle combinations increased the average payload hauled per sortie from 6.5 to 18 tons in addition to the weight of the dolly and the semitrailer. A MTOE change was requested adding 40 semitrailers and 20 dolly converters to each of the light truck companies (5-ton). Under certain conditions, the use of semitrailers and dolly converters may be a useful expedient for increasing the capabilities of light truck companies. However, not enough information is available to determine whether the procedure should be treated as more than an expedient.

5. (U) USACDC Action: USACDC forwarded a letter, subject: Test and Evaluation Report on Composite Vehicle, to USAMC on 9 April 1969 requesting that USAMC investigate the impact of the idea on maintenance requirements. Upon receipt of this information, the doctrinal and organizational aspects of the concept will be further evaluated.

1. (U) Reference: Operational Report - Lessons Learned, 10th Transportation Battalion (Terminal), 31 July 1968.

2. (U) Item: Modification of Terminal Service TOE's.

3. (U) Unit Comments:

a. The TOE used to organize terminal service units is not appropriate for the cargo handling missions of the units attached to this battalion. TOE-117D under which terminal service units are organized was devised when a 15 man hatch gang was needed to manually handle loose cargo. The majority of cargo handled at present is either palletized or containerized. This necessitates the use of material handling equipment (MHE) in the hatches of cargo vessels. As a result of this increased requirement for MHE, the limited number of MHE on hand required that the equipment be utilized by both day and night shifts. This constant use of MHE increases maintenance down time and lowers the life expectancy of the equipment. The cycle created by overworking MHE, resulting in equipment breakdown and a high deadline rate presents a serious problem especially when discharging vessels in the stream. Due to the time factor involved when transporting MHE maintenance personnel and parts to a vessel in the stream, a forklift that becomes deadlined halts discharge operations on the hatch for a considerable time. If a sufficient amount of MHE were available, the forklifts could be rotated during shift change, operations would not be affected, allowing ample time for the performance of maintenance without adversely affecting performance. It is recommended that additional MHE and maintenance personnel be added to the terminal service units to meet the present cargo handling requirements, and that the number of personnel per gang be reduced to ten.

b. Other Headquarters' Comments: 1st Logistical Command. It is most important that MHE in any type unit be afforded the greatest possible attention to proper care and maintenance. Forklifts used on vessels in the stream are subject to deterioration faster than those utilized in warehouses. Consideration might be given to increasing the maintenance float authorization for MHE engaged in terminal service operations and that this float be positioned near to the area of operations. Concur in the statement that the number of personnel authorized by TOE to physically handle cargo may be excessive in light of the universal increase in the use of palletized and/or unitized cargo.

4. (U) USACDC Discussion:

a. Concur with 1st Logistical Command that increasing the maintenance float (operational readiness float) authorization for MHE engaged in terminal service operations and positioning this

float near the area of operations will overcome this difficulty. However, it should be borne in mind that the operational readiness float items are not authorized at the operating organization but are theater supply assets and not TOE items. If justified, standby equipment may be authorized by para 11d, AR 310-34 as a MTOE action.

b. While reduction of personnel appears desirable in this unit it may not necessarily be desirable for all units organized under TOE 55-117D for the following reasons:

(1) There are requirements for unitizing cargo going into Vietnam that do not apply to other theaters.

(2) This battalion is not operating amphibian vehicles such as the LARC-15 which can require personnel from the terminal service company to be utilized in the jumper system.

5. (U) USACDC Action: USACDC has scheduled a MACRIT study covering cargo operations. This study scheduled for FY 70, will address the size of the hatch crew required for TOE world wide application.

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1. (U) Reference: DA Senior Officer Debrief, MG Charles P. Stone, former Commanding General, 4th Infantry Division, 15 November 1968.
2. (U) Item: Signal Support - Organization and Equipment.
3. (C) Individual's Comments: The extensive size of the 4th Division AO and the need for flexibility and rapid mobility in operations have burdened the organic signal battalion's archaic organization and equipment, thus necessitating regrouping of the battalion, and tailoring communications centers from independent teams. The bulkiness of major items of communications equipment inhibits their deployment in fluid situations.
4. (C) USACDC Discussion: The present "G" series IOE 11-35G, Division Signal Battalion, contains old multichannel assemblages (AN/MRC-69, and AN/MRC-54 mounted on 2½ T cargo trucks) which limit mobility of the unit. Change 2 to TOE 11-35G, currently being staffed, incorporates the second generation Army Area Communications System assemblages mounted on trucks ¼ ton, 1¼ ton, and 2½ ton. This will increase the responsiveness of the battalion to division needs; however, until such time as this change, an outgrowth of the Tactical Army Communications Study recommendations, is fully implemented by Department of the Army, some of the above mentioned shortcomings in this unit will continue to exist.
5. (C) USACDC Action: Action required to correct the shortcomings has been taken with the development of Change 2 to TOE 11-35G, within the limitations imposed by the Department of the Army on the updating of this TOE by letter, FOR OT OM TO, Headquarters Department of the Army, subject: Implementation of the TACOM Study in TOE, 6 March 1969.

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1. (U) Reference: Operational Report - Lessons Learned, 64th Quartermaster Battalion, 31 July 1968.
2. (U) Item: Shortage of Vehicle Tow Bars.
3. (U) Unit Comments: Three medium truck companies are each committed daily for three to five M52 series tractors for recovery purposes on convoys, but by TOE 55-18F each company is authorized only two tow bars. Therefore, tow chains have to be used for recovery purposes. A tow chain is not considered safe nor is it able to do the job efficiently. The rough roads and dusty conditions make towing a vehicle with a chain a dangerous proposition, as the chain sometimes breaks or slips causing damage to the vehicle. Also, towed vehicles, without brakes, ride up and strike the vehicle ahead. It is recommended that transportation truck units operating in Vietnam be given special authorization to have at least four tow bars per company.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: This item, was incorporated in TOE 55-18G, Change 6, which was submitted to DA on 2 Jun 69. Approval will change the authorized number of tow bars from two to twelve per company.

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1. (U) Reference: DA Senior Officer Debriet Report, LIG Stanley R. Larsen, former Commanding General, I Field Force Vietnam, 31 July 1967.
2. (U) Item: Assignment of a Collection Manager to G2/S2 Staff.
3. (C) Individual's Comments: There are now so many varied agencies and activities involved in the collection of intelligence information that each G2/S2 staff section requires and should have a collection manager to tie them together. No such individuals are authorized on tactical TOE's. This problem was overcome in IFFV staff by the utilization of the MI Detachment commander in a dual capacity as collection manager, although in the long run this detracted from his job as commander. On a long-term basis the Army should consider both intelligence collection and production activities in its TOE's at least down through brigade level where a single collection officer would suffice. Daily coordination by the G2 has been necessary with approximately twenty-five various sources of information. The number is nearly the same at division level.
4. (U) USACDC Discussion: None.
5. (C) USACDC Action: TARS-75 and the Basic Derivative Study Intelligence-75 provide battle information and control centers (BICC) or battlefield information centers (BIC) for all types of combat units from battalion through corps. A function of the BICC/BIC System is to provide a means for the control of all intelligence assets within a command.

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1. (U) Reference: Operational Report - Lessons Learned, 3d Infantry Division, 31 July 1968.
2. (U) Item: FM Intelligence Net.
3. (C) Unit Comments: During the Conduct of Exercise CARBIDE STEEL I it became evident that the best way to effectively maintain the flow of information through intelligence nets at brigade level is to have an additional AN/VRC 47 radio with RC-292. This enables the Brigade S-2 to keep the brigade and division intelligence nets separate so that traffic passed on one net does not interfere with passage of traffic on the other. The use of the RC-292 antenna increases communications capability for the highly mobile and far ranging operations which might be expected in this theater. The use of only one radio requires a constant switching of frequencies on the main set causing loss of air time and delays in passing messages. It is important for the brigade to know what is happening in other unit sectors (division net) since it may have to assume another unit's mission. It is equally essential that enemy information from subordinate units be passed rapidly through channels for early processing and use. An additional AN/VRC 47 radio and RC 292 antenna should be authorized in the brigade S2 section.
4. (U) USACDC Discussion: USACDC recognizes the need for a separate intelligence net.
5. (C) USACDC Action: TARS-75 and the Basic Derivative Study Intelligence-75 provide a separate intelligence net.

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1. (U) Reference: DA Senior Officer Debrief Report, MG Thomas H. Scott, Jr., former Commanding General, 1st Logistical Command, 16 October 1968.
2. (U) Item: Currently Prescribed Computerized Supply Procedures.
3. (C) Individual's Comments: Currently prescribed computerized supply procedures, as they relate to the support of combat operations, require further evaluation and objective analysis in light of lessons learned during the war in Vietnam. The Red Ball Express System for supplying repair parts in Vietnam should be expanded to other theaters.
4. (C) USACDC Discussion:
 - a. In developing the TASTA-70 study and the CAAS-75 study and its basic derivative studies, currently prescribed computerized supply procedures have been analyzed and evaluated. Also, the combat service support system (CS3) program has thoroughly analyzed and evaluated current computerized supply procedures. The results of these studies should culminate in an improved combat service support system for Army-75. Additionally, the Army-85 Concept Study acknowledges the necessity for further analysis, evaluation, and improvement of the combat service support system. Thus, computerized supply procedures will be further developed and refined in the Army-85 doctrinal study program.
 - b. The TASTA-70 study, CAAS-75, and its basic derivative studies acknowledge the necessity for a more responsive combat service support system which includes the processing of repair parts. These studies provide a sound doctrinal base for combat service support during the 1970-1975 period. Specially designed systems, such as the Red Ball Express System, are not considered desirable since they tend to detract from the overall responsiveness of the total combat service support system.
5. (C) USACDC Action: The Army-75 and Army-85 doctrinal study programs will develop improved doctrinal concepts for automated combat service support systems.

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1. (U) Reference: Operational Report - Lessons Learned, Report 4-68, Communications-Electronics Lessons Learned, Office of the Adjutant General, DA, 18 October 1968.
2. (U) Item: Reduced Data Transmission Time Due To Card Jamming.
3. (U) Unit Comments: Data equipment is set by a manufacturer's representative to accept cards of a particular size. When the card size varies beyond the tolerance of the equipment settings, card jams occur and traffic cannot be passed. This has been a chronic problem in data communications in Vietnam. Variation in card size is due to non-standardization among manufacturers. Further, cards often become warped and swollen due to improper packaging for storage in a high humidity environment.
4. (U) USACDC Discussion: More rigid specifications are required to standardize card size and improve card quality. Cards should be packed in sealed plastic containers and stored under controlled conditions when received.
5. (FOUO) USACDC Action: This item will be incorporated in a forthcoming SDR for the Family of Data/Teletypewriter Input/Output Station Equipment (ACN 14292). The SDR will specify stringent tolerances for cards to assure that this objective is met. Additionally, the SDR will specify that the card material selected should not be susceptible to warping from the effects of high humidity.

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1. (U) Reference: Trip Report (00-08), Logistical Support for an Independent Brigade, USACDC Liaison Detachment, USARV, 12 December 1968.

2. (U) Item: Logistical Support For An Independent Brigade.

3. (U) Unit Comments:

a. The support battalion has organized a provisional truck platoon by pooling the assets of the companies of the battalion. Most truck mounted shelters were dismantled and the trucks are being used to transport cargo. Officers of the brigade stated that there is a requirement for an organic medium truck platoon. Present travel time from the brigade rear at Phu Loi to the FSE is approximately one hour, with an additional hour required to arrive at the battalion FSB's. Personnel for this provisional platoon are drawn from brigade overages. Presently the brigade is at 110% authorized strength. Should the strength of the brigade decrease, the battalion will find it difficult to provide drivers for the vehicles.

b. Other Headquarters' Comments: USARV, ACoS G3. The inclusion of a truck platoon as an organic part of the brigade is a requirement that exists only in certain circumstances when support functionalities such as 1st Log Comd, are incapable of providing vehicles from their subordinate units to move cargo or personnel. This transportation requirement is recognized and it is recommended that a transportation platoon be included in a new TOE as an augmentation that could be authorized if necessary.

4. (U) USACDC Discussion: This subject has been reviewed as a result of this and similar comments from other activities and is the subject of a Vietnam special data collection effort examining combat service support requirements for Independent Brigade Operations. As a result of this examination it has been determined that a truck company, rather than a platoon, is normally required by a separate brigade.

5. (U) USACDC Action: USACDC has developed for CAAS-75 a manning table and equipment list (MTEL) for a transportation motor transport company, organic to the support battalion of independent brigades. This unit consists of two light truck platoons of two squads each for a total of 40 trucks, 2 ½-ton, with trailer, 1½-ton, and one medium truck platoon of one squad of twelve medium cargo trucks (5-ton truck-tractor, 12-ton semitrailer, 12-ton S&P) and one squad of ten truck-tractor-semitrailer, tank, fuel servicing, 5,000 gallon capacity.

1. (U) Reference: Operational Report - Lessons Learned, Americal Division Support Command, 31 October 1967.
2. (U) Item: Deployment of Combat Service Support Elements.
3. (U) Unit Comments: Brigades deployed under operational control of other than their parent division headquarters must bring their organic or divisional fair share of combat service support. The DISCOM, as organized, cannot adequately support such attachments.
4. (U) USACDC Discussion: Paragraph 4b of FM 54-2, The Division Support Command, dated September 1965, contains specific information which states "When the support command is fragmented in this manner" (provide support elements for attachment to brigades for independent or semi-independent operations of limited duration), "field army support command troops may be required to augment the division support command."
5. (U) USACDC Action: The updated version of FM 54-2, which is programmed for delivery to TAG in first quarter FY 70 for publication, maintains this item and includes the role of the corps support brigade as an additional source of assistance.

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1. (U) Reference: Operational Report - Lessons Learned, Corps Artillery (PROV) Vietnam, 31 July 1968.
2. (U) Item: Air Photographic Reconnaissance Support.
3. (C) Unit Comments (Summary): Photo reconnaissance mission readouts in support of raids by firepower must be timely for prompt engagement of targets. Timeliness can be obtained by employment of direct radio teletype communications to expedite the transmission of photo reconnaissance.
4. (C) USACDC Discussion: Rapid transmission of intelligence information is in consonance with current and proposed (Army-75) doctrine.
5. (C) USACDC Action: The Army-85 doctrinal study program will further address the rapid transmission of intelligence information.

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1. (U) Reference: Operational Report - Lessons Learned, 9th Infantry Division, 31 July 1967.
2. (U) Item: Photographic Processing.
3. (C) Unit Comments: The 9th Signal Battalion Photographic Section has the capability for processing 75 contact prints per day. The amount demanded exceeds 400 prints per day. Larger laboratory facilities are required.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: A Draft Proposed Revision Qualitative Materiel Requirement for a Tactical Imagery Processing Laboratory (TIPL), dated 8 April 1968, has been distributed for world wide review. This QMR is a revision of Paragraph 1539a(7) of the CDOG and is identified as USACDC Action Control Number 1324. The laboratory will probably be mounted in a five-ton expansible van with a second non-expansible van for storage, thus providing added workspace. The planned employment is for this laboratory to be located near the Tactical Imagery Interpretation Facility (TIIF) so as to process intelligence imagery as well as all other photographic requirements at division, corps and field army. The TIPL is presently in the Army-75 Combat Development Program.

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1. (U) Reference: Operational Report - Lessons Learned, US Army Transportation Command Cam Ranh Bay (PROV), 31 July 1968.

2. (U) Item: Inflated Priorities and Required Delivery Dates.

3. (U) Unit Comments:

a. USARV Message 56942, 25 June 68, stated that the movement of cargo and personnel in RVN is being hampered by indiscriminate use of transportation priorities and unrealistic RDDs. A three-month survey of local cargo offering indicated that 38% were priority 01; 60% were priority 02; 2% were priority 03; and 0% priority 04. On 2 July, the Director of Transportation tasked the Movements Control Center with scrutinizing each cargo offering for unrealistic priorities and delivery dates. This office was also given the authority to challenge offerings of doubtful validity. Movement Control activities should establish a close working relationship with higher and adjacent headquarters to challenge successfully the numerous high priority offerings and to determine the lowest priority that can adequately meet the requirement.

b. Other Headquarters' Comments: 1st Logistical Command. Inflated priorities and required delivery dates hamper the effectiveness of the transportation system. Action being taken by the Movements Control Center to challenge offerings of doubtful validity should decrease the misuse of priorities.

4. (U) USACDC Discussion:

a. The problem of inflated priorities and unrealistic required delivery dates is an ever present problem and the action taken by the Army Transportation Command Cam Ranh Bay (Provisional) is one solution. However, it should not be accepted either as doctrine or as a necessarily desirable concept for implementation in other areas. The challenging actions should commence with a validation of supply priorities of MILSTRIP requisitions at the first echelon directing a supply transaction and should continue through all subsequent echelons. It is this MILSTRIP requisition supply priority and the RDD which are the basis for transportation priorities; only the activity with overall knowledge of supply commodity and status is able to determine the urgency of need. This is definitely not a transportation activity.

b. An example of the challenging (priority validation) procedure is to be found in the AMC logistics control offices which, within specified guidelines, validate the requirement for air movements from CONUS to oversea destinations.

c. The movement control activity should question any movement requirements which are probable errors, are obviously not warranted, or which violate the tenets of sound transportation management. Similarly, when transportation priority requirements exceed transportation capacity to meet such requirements, the supply activity must be advised and a command decision secured to determine what will be moved within the available transportation capability.

5. (U) USACDC Action: The collocation of the supply and movements management activities or their unification, as outlined in the Army-85 Combat Service Support Base Development Study, should do much to alleviate the overall problem.

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1. (U) References:

a. Operational Report - Lessons Learned, 25th Infantry Division, 31 July 1968.

b. Tactical Notes, Vol 1, #8, I Field Force Vietnam, December 1968. (Page ?)

2. (U) Item: Unit Identification and Location During Periods of Reduced Visibility.

3. (C) Unit Comments: With command emphasis on night operations the necessity of air support during periods of limited visibility has increased considerably. Air support elements, however, experience difficulty in identifying the exact location of friendly ground troops. Night air support is enhanced and the possibility of costly accidents is eliminated when a prearranged system is established for marking the exact position of ground forces. The strobe light has proven to be a most effective device to accommodate a system of ground to air visual night communications.

4. (C) USACDC Discussion: White phosphorus grenades, illuminating rounds, trip flares, field expedient mixtures of sand and fuel in No. 10 cans, railroad flares and flashlights have been used to mark troop unit locations on the ground. These items produce visible light which discloses the unit's location to the enemy and tends to cause night blindness. After ignition of WP grenades, trip flares and other similar devices, the user has little control over the amount of light emitted, position or length of time the pyrotechnic material burns. While these emergency visual methods of identification should be readily available when conducting night tactical operations a more effective and flexible device should be developed and issued to combat units.

5. (C) USACDC Action: A Landing Zone Directors Signal System being considered for world-wide use by the Army in the field was approved by DA in Message 909601 on 20 May 69. BOI and SPR are currently being prepared for this item. A transponder device of the type used in the Gunship II Concept will also be given consideration for application in this field. USACDC will continue to monitor developments of these signal devices.

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1. (U) Reference: Tactical Notes #8, I Field Force Vietnam, December 1968. (pages 6,7)

2. (U) Item: Preparation of an Abatis.

3. (U) Unit Comments: The 4th Infantry Division completed a combined operation with CSF elements which included the maximum destruction of a road. Several significant observations were made in the preparation of an abatis.

a. It is difficult to control the fall of trees with leaves when winds exceed 15 knots.

b. Areas subjected to numerous artillery and air strikes are the least desirable for an abatis location.

c. An accurately calculated and placed charge makes the difference between complete cutting of the trunk or leaving it attached to the stump.

d. Seed the abatis with persistent CS powder.

e. A completed abatis should be made a no-fire zone for pre-planned missions to prevent destruction of the obstacle and dispersion of persistent CS powder placed on the obstacle.

4. USACDC Discussion: While the opportunities for construction of abatis may be limited and under some circumstances undesirable when friendly forces have extensive mechanized and motorized surface assets, nevertheless its use as an obstacle in stability operations is enhanced through the addition of persistent CS. Road and trail denial operations do have a significant neutralizing effect on the repositioning of the enemy's assets and little, if any effect, when extensive dependence is placed on air lines of communication.

5. (U) USACDC Action: This item will be incorporated in the next scheduled revision of FM 7-11 and 7-15.

1. (U) Reference: Operational Report - Lessons Learned, 19th Engineer Battalion, 31 July 1968.
2. (U) Item: Probing Suspected Mine Locations.
3. (U) Unit Comments: Probing for suspected electrically detonated mines should be done with a probe made of non-conductive material. A metal probe will complete the triggering circuit of electrically detonated mines when passing over or through the wires. This conduction only exists when a mine has its own power source. However, this cannot be determined prior to probing.
4. (U) USACDC Discussion: Change 1 to FM 20-32, Landmine Warfare, cautions that a non-ferro-magnetic probe is to be used when the presence of magnetic influenced fuzed mines is known or suspected. Such probes are made locally from available materials, (i.e., brass, sharpened wooden stick, splinter from packing crate, or sapling).
5. (U) USACDC Action: This item will be incorporated in the FY 70 revision of FM 20-32.

CONFIDENTIAL

1. (U) Reference: Operational Report - Lessons Learned, 5th Special Forces Group (Airborne), 1st Special Forces, 31 October 1967.
2. (U) Item: River Operations with Assault Boats.
3. (C) Unit Comments (Summary): The 1st Special Forces discusses various techniques for conducting river patrols. Areas covered include composition of the patrol, armament, action when a boat is disabled, communications, checking personnel on waterways, handling detainees, FAC support, marking enemy positions and movement of troops.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: This item is currently covered in FM 31-75 (Test), Chapter 5 - Section I and Appendix C and will be considered as an area requiring more detailed discussion in the next scheduled change or revision of FM 31-75.

CONFIDENTIAL

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1. (U) Reference: Operational Report - Lessons Learned, 5th Special Forces Group (Airborne), 1st Special Forces, 31 October 1967.
2. (U) Item: Enemy Countermeasures Against Airboats.
3. (C) Unit Comments (Summary): The enemy has developed several countermeasures against airboats to include mining channels, planting stakes to rip out the boat bottoms and planting grenades with trip wires under the surface of the water. Navigation by the airboats is difficult because of restricted visibility and high speeds, thus they tend to utilize known channels or previously used routes.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: This item will be considered for incorporation in the next scheduled change or revision of FM 31-75.

CONFIDENTIAL

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1. (U) Reference: Operational Report - Lessons Learned, 269th Combat Aviation Battalion, 30 September 1968.
2. (U) Item: Troop Formations in Pick-up Zones.
3. (C) Unit Comments: The normal procedure for pick-up of troops is for the aircraft to land inside the line of troops. This procedure prohibits door gunners from firing as troops land the aircraft. This unit has developed pick-up procedures with units of the 25th Infantry Division that overcame some of the limitations of the normal pick-up. On final extraction from potentially hot PZ's, the infantry unit emplaces claymore mines around the PZ's and lines up for extraction in a back to back fashion. When the lift aircraft are on final approach to the PZ, the infantry unit detonates the claymore mines on command from the airmobile task force commander. The aircraft then land on the outside of the loads, load and depart the PZ with full suppressive fires by the outside door gunners. It is believed that this method of extraction has prevented enemy fire on many occasions averting the possible loss of both men and aircraft.
4. (U) USACDC Discussion: This procedure appears to have limited application due to the problems (supply, transportation and emplacement time) involved in providing adequate claymore coverage for the PZ, particularly on multiship PZ's or for multiple PZ operations.
5. (U) USACDC Action: This item will be considered for incorporation into appropriate air cavalry employment field manuals.

CONFIDENTIAL

1. (U) Reference: Operational Report - Lessons Learned, Americal Division, 31 July 1968.
2. (U) Item: Helicopter Broadcasts.
3. (U) Unit Comments: In order to provide the greatest flexibility in conduct of aerial broadcasts, use should be made of helicopters as an aerial platform for quick reaction requirements. To gain maximum effect the following guidelines should be followed:
 - a. Aircraft maintain altitude of 700-900 feet.
 - b. Small target area should be selected such as one hamlet or concentrated troop area.
 - c. Aircraft should bank into the target area so that speakers are inclined at 45° angle.
 - d. Wind direction must be considered, it may be necessary at times to fly upwind in order for broadcasts to be heard in designated areas.
 - e. Aircraft forward speed should not exceed 80 knots.
 - f. Torque should be reduced on helicopter's blade in order to reduce blade slap noise to a minimum.
4. (U) USACDC Discussion: Stated altitude of 700-900 feet should be reconsidered. Providing it is within the capability of the loudspeakers, an altitude of 1500 feet should be maintained to decrease the possibility of destruction of the aircraft by hostile ground fire.
5. (U) USACDC Action: This item will be considered for incorporation in future changes or revisions of FM 33-1 and FM 33-5.

1. (U) Reference: Letter, Command Summary - Debriefings of Returnees from Vietnam, HQ USACDC, 29 October 1968. (Page 5)

2. (U) Item: HUEYCOBRA.

3. (U) Individual's Comments (Summary): The HUEYCOBRA could replace the present gunship on a one to one basis, but certainly not fewer than that. The HUEYCOBRA may increase the firepower and ordnance carrying capability over the present armed helicopter, but if eight UH-1Bs and UH-1Cs are replaced by fewer than eight HUEYCOBRAS, the capability to break a unit down into two heavy teams and a light team or four light teams will no longer be possible. Basic mathematics would dictate that eight can more readily be employed than fewer numbers and still retain maximum unit flexibility.

4. (U) USACDC Discussion: The eight gunships discussed are a result of MTOE action of the assault helicopter company (AHC). The Aviation Organizational Requirements for the Army (AORTA) study group addressed the integration of armed helicopter into assault helicopter units. The study group concluded that six gunships with a 75 percent availability are sufficient to perform the primary mission of escort and protection for an AHC of 28 ships.

5. (U) USACDC Action: This item will be considered in subsequent actions relating to armed helicopters.

1. (U) Reference: Letter, Command Summary - Debriefings of Returnees from Vietnam, HQ USACDC, 29 October 1968. (Page 3)
2. (U) Item: Light Airmobile Company.
3. (U) Individual's Comments (Summary): The number of aircraft in the airmobile company and the assault helicopter company should be increased to 28. Operating at a realistic 70-75 percent availability rate, this will provide these companies with a lift capability.
4. (U) USACDC Discussion: The assault helicopter company will be increased to 28 UH-1 aircraft when ARCSA II is approved for implementation. With an availability of 80%, this will allow 22 UH-1 to participate in lift missions. In the Aviation-75 basic derivative study, assault helicopter companies were structured with 28 UH-1H aircraft.
5. (U) USACDC Action: The Aviation Organization Requirements of the Army (AORTA) Study addresses the number of aircraft in the airmobile company. USACDC will continue to study this problem.

1. (U) Reference: Operational Report - Lessons Learned, 52d Combat Aviation Battalion, 31 July 1968.

2. (U) Rearming and Refueling of Helicopters.

3. (U) Unit Comments:

a. Helicopters operating from other than base stations require assistance in rearming and refueling. It is not practical for the aviation unit to provide the ground personnel needed for these jobs when the aircraft are operating from dispersed areas forward of their unit base. The battalion recommends that this service be provided by the supported unit.

b. Other Headquarters' Comments:

(1) 17th Combat Aviation Group - 1st Ind. Concurs in the fact of the requirement and recommends that I Field Force Vietnam task units receiving helicopter support.

(2) I Field Force Vietnam - 2d Ind. Dissents to both the battalion and group solutions. To safely assist in rearming of the AH-1G, aerial weapons systems personnel should be trained. Aviation companies have trained personnel who acted as door gunners on the UH-1B/Cs. These gunners should be retained by units receiving AH-1Gs and made available at the forward supply points to safely expedite refueling/rearmament.

(3) 1st Avn. Bde - 3d Ind. Registers non-concurrence with all preceding suggestions and reports that a MTOE submitted to DA for Aviation Aerial Weapons companies will replace currently authorized door gunner spaces with aircraft armament mechanics and ammunition handlers, alleviating the deficiency. Their further recommendation is that the Combat Aviation Battalion transport its own personnel to the rearm/refuel points as needed.

4. (U) USACDC Discussion: The position projected through Supply-75 is that the using aviation unit retains responsibility for rearming and refueling its air vehicles. Present indications are that:

a. The density of aircraft operating from forward areas will greatly increase.

b. The resultant demands for fuel will become much higher.

c. More sophisticated aerial weapons systems will require increased ammunition supply.

5. (U) USACDC Action: USACDC will consider this item in the Army 85 study.

1. (U) Reference: Operational Report - Lessons Learned, 269th Combat Aviation Battalion, 30 September 1968.
2. (U) Item: Air Traffic Control During Airmobile Operations.
3. (U) Unit Comments: On many airmobile combat assault operations, unscheduled or unannounced aircraft have entered the AO and interfered with the landing or extraction being accomplished. To insure absolute control of air traffic within the AO, all aircraft operating in support of the operation should contact either the Air Mission Commander on his UHF frequency or the Airmobile Task Force Commander on his command FM frequency prior to entering the area.
4. (U) USACDC Discussion: This method of air traffic control is widely used in Vietnam; however, it must be recognized that control of airspace in an AO is a function of the ground force commander.
5. (U) USACDC Action: This item will be considered for incorporation into appropriate air cavalry employment field manuals.

1. (U) Reference: Letter, Air Cavalry Operations in the Delta, 164th Aviation Group, 1 November 1968.
2. (U) Item: Air Cavalry Operations in the Delta.
3. (U) Unit Comments (Summary): The unit conducted a detailed and comprehensive analysis of all aspects of air cavalry employment in the Mekong Delta. Although the report covered a period of less than five months the unit considered that the data developed and the scope of operations conducted represented an adequate basis from which sound and substantive conclusions could be drawn. The study was primarily concerned with wet season employment doctrine for air cavalry units.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: This item will be considered for incorporation in the next scheduled change or revision of appropriate air cavalry employment doctrinal literature.

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1. (U) Reference: Operational Report - Lessons Learned, II Field Force, 31 October 1968.
2. (U) Item: Pile-on Operations.
3. (C) Unit Comments: When fighting an elusive enemy, it is mandatory that all potentially large contacts be exploited to the fullest by rapid reinforcement of friendly forces with large numbers of maneuver elements. This "Pile-on" tactic should be incorporated into Infantry doctrine.
4. (U) USACDC Discussion: Incorporation of the term "Pile-on" in doctrinal literature is not warranted. The "Pile-on" tactic described is a technique of applying the principle of mass in a fluid situation by employing encirclement tactics using mobile forces to fix the enemy and by maximum use of fire support means to destroy the enemy. The integration of firepower and maneuver is well documented in FM 100-5 and 61-100 and in the 7-series of FM.
5. (U) USACDC Action: Those field manuals for which USACDC has proponency will be examined during scheduled change or revision to insure that, in fluid warfare, the decisive nature of the encirclement when coupled with massive employment of fire support is adequately stressed.

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1. (U) Reference: Trip Report on the CS Evaluation Team, USACDC Liaison Detachment, US Army Vietnam, 15 April 1968.
2. (U) Item: CS Employment.
3. (C) Unit Comments (Summary): The doctrine, tactics, and techniques for the employment of CS munitions are inadequate. Most units fire CS first followed by HE and then an assault on the position. Some units reverse the firing sequence and then assault the position. Frequently, exploitation is not possible because troops do not have protective masks. CS is also used in a defensive role and in a harassing role by dropping drums from CH-47 aircraft.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: This item will be considered for incorporation in the next scheduled change or revision of FM 101-40(J).

1. (U) Reference: DA Pamphlet No 350-15-12, Training, Operations - Lessons Learned, 1 January 1969.

2. (U) Item: Use of Flamethrowers by Ambush Patrols.

3. (U) Unit Comments:

a. Covered by darkness and with a good percentage of our men shooting too high, many VC/NVA caught in ambushes are able to escape. To make ambush patrols more effective, organic units now send one portable flamethrower from the flame platoon with each ambush patrol. Used on ambushes, the flamethrower can serve three purposes. If sprayed in the kill zone immediately after the initial burst of fire, flame will insure 100 percent kill in that area. Secondly, flame directed into depressions will both illuminate the target and force the Viet Cong who have taken cover to rise and run, framing them against the light background and making them good targets for aimed small arms and automatic weapons fire. Finally, flame can serve as an equalizer when an ambush patrol finds itself facing a numerically superior force.

b. Other Headquarters' Comments: USCONARC. In the same report the following observation on illumination for ambush patrol fires is made: "Frequently the time taken to obtain clearance for artillery illumination near populated area is excessive. As an alternative, hand thrown trip flares have proven very successful. The flares can be thrown to the back side of the kill zone, silhouetting the enemy without showing the ambush patrol as do ordinary flares. Personnel must be instructed about safe handling because flares do not have a delay type fuse. Trip flares are also a good method of showing the front trace of friendly forces for an airstrike at night."

4. (U) USACDC Discussion: The use of portable flamethrowers in counterinsurgent operations is discussed in USCONARC publication TC 3-16 and in FM 20-33. These publications provide the detailed guidance needed by the tactical commander to conduct night ambushes utilizing flame weapons.

5. (U) USACDC Action: USACDC will continue to monitor the use of flame effectiveness in ambushes and consider this item for incorporation into the next scheduled change or revision of appropriate Infantry publications.

1. (U) Reference: Trip Report (7-69), Air Defense Artillery and Search Light Batteries in a Ground Mode, USACDC Liaison Detachment, US Army Vietnam, 17 Jun 69.
2. (U) Item: Inadequacy of 2½-Ton Truck as M-55 Carrier.
3. (U) Unit Comments (Summary): The 2½-ton truck appears to be too light as a transport/carrier for the Quad. The truck frame is cracking in several locations. There is no specific spot where the cracks occur. The Battalion CO recommends the 5-ton truck as a replacement for the 2½-ton truck and is taking action in this matter.
4. (U) USACDC Discussion: None.
5. (U) USACDC Action: This item will be considered for incorporation in the next scheduled change or revision to TOE 44-85 AW Bn and 44-58 MG Battery.

CONFIDENTIAL

1. (U) Reference: Operational Report - Lessons Learned, Capital Military Assistance Command (PROV), 31 October 1968.
2. (U) Item: Development of PSYOP Material by Non-PSYOP Trained Personnel.
3. (C) Unit Comments: Material developed by non-PSYOP trained personnel should be forwarded through PSYOP channels for screening prior to usage.
4. (C) USACDC Discussion: Non-PSYOP personnel are not trained to recognize effective PSYOP employment in relation to native/local environment. Ethnic and cultural differences, for example, frequently make communication with Vietnamese Nationals difficult. Efforts on the part of non-PSYOP trained personnel may often result in counterproductive results or in discredit to other PSYOP media.
5. (U) USACDC Action: This item will be considered for incorporation in future changes or revisions of FM 33-1 and FM 33-5 and in the compilation of future doctrine for which USACDC has responsibility.

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1. (U) Reference: Operational Report - Lessons Learned, 25th Infantry Division, 31 July 1968.

2. (U) Item: PSYOP/MEDCAP Projects During Cordon and Search Operations.

3. (C) Unit Comments: The use of PSYOP/MEDCAP projects in conjunction with cordon and search operations within civilian areas helps explain to the civilian population the reason for the military intrusion. Such an explanation can also stress the positive benefits which will accrue to the civilian population as a result of the military operation.

4. (C) USACDC Discussion:

a. The utilization of psychological operations teams and medical civic action teams in a civilian area that has just been cordoned and searched has proved to be effective. The PSYOP team informs the inhabitants of the reasons for the military operation. This helps suppress additional opposition. The MEDCAP team, on the other hand, provides medical care in such a way as to associate the treatment directly with the actions of the soldiers in the area. Knowledge of such PSYOP/MEDCAP activities will spread quickly to other areas and localities which will most likely result in the formation of more receptive civilian attitudes.

b. However, PSYOP/MEDCAP activities in conjunction with cordon and search operations should not be merely a standard operating procedure, but instead, should only be used in cases where the PSYOP/MEDCAP team can predict favorable results. Indiscriminate use of PSYOP/MEDCAP teams in the midst of combat operations could cause discredit to their activities.

5. (U) USACDC Action: This item will be considered for incorporation in future changes or revisions of FM 33-1 and FM 33-5.

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1. (U) Reference: Operational Report - Lessons Learned, Military Police Group (CI) (PROV), 18th MP Brigade, 31 July 1968.
2. (U) Item: Clerk-Typist (MOS 71B20) Assigned to CID Units.
3. (U) Unit Comments (Summary): Vietnamese Nationals employed locally as typists have almost no English language skills. Consequently, the preparation of CID case reports by these typists presents an administrative problem of massive proportions. In some detachments, over 100 completed reports of investigation await typing. Reduction of the typing backlog has proved to be impossible in many units because of the necessity to retype completed work a number of times and the unavailability of locally employed typists for more than 50 hours of work per week. School-trained clerk-typists (MOS 71B20) should be made available for duty in each CID field office in Vietnam on the basis of one clerk-typist (MOS 71B20) per each three accredited or apprentice investigators. In addition, it is significant to note that each of these investigators is supervising from one to three non-CID investigators who also generate investigative reports and allied documents.
4. (U) USACDC Discussion: The 18th MP Brigade concurs by indorsement that school trained military typists are preferable to local national civilian clerical personnel, and current workloads preclude the final preparation of reports by investigators themselves. Pending any future change to Functional Teams, Criminal Investigation, TOE 19-500, spaces for MOS 71B20 or 71B30 may be requested by the submission of proposed MTOE, justifying the positions required. MTOE 19-500E, dated 20 June 1968, authorizes 20 personnel, MOS 71B30.
5. (U) USACDC Action: USACDC will continue to monitor clerk-typist requirements by CID units and examine the feasibility of increasing the spaces for MOS 71B20 and MOS 71B30 in the Functional Teams, Criminal Investigation, during the next programmed revision of TOE 19-500G.

1. (U) Reference: Evasion and Escape Memorandum Number Nine:
"Resistance to Interrogation--Lessons Learned from the Experience
of American PWS Released from Captivity in North Vietnam," Office
of ACS, Intelligence, HQ USAF, 29 January 1969.
2. (U) Item: Resistance to Interrogation.
3. (U) Unit Comments (Summary): Approved methods of resisting
interrogation are much more sophisticated than the familiar ploy
"name, rank, serial number, and date of birth." This blunt no-
answer technique, in effect, tells the interrogator that the prisoner
can but will not disclose valuable information. Instead, when
questioned the prisoner should use any one or combination of the
following techniques: claim ignorance of the answer to the question,
claim an inability to comprehend or understand the question, or claim
an inability to think (due to head injuries or mental duress). A
credible application of these techniques will persuade the interro-
gator that the prisoner is a source of unreliable information.
4. (U) USACDC Discussion: It should be stressed that interrogators
will, as part of a well thought out interrogation program, ask the
same questions again and again over a period of many months. There-
fore, if he is to be successful, the resistor must at all times stay
within the framework of the role he has chosen. Current training
programs do not prepare the individual soldier for such a contingency.
5. (U) USACDC Action: This item will be considered for incorporation
in future changes or revisions of FM 31-20 and FM 21-77A. This
information has also been furnished to United States Army Special
Warfare School, for consideration and possible incorporation in
techniques publications.

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1. (U) Reference: Operational Report - Lessons Learned, 3d Brigade, 82d Airborne Division, 31 July 1968.

2. (U) Item: Military Intelligence Officers.

3. (C) Unit Comments:

a. (U) It is imperative that officers assigned to Battalion S-2 positions be trained in the collection of intelligence information and in utilization of various agencies available to the combat commander. During the month of July, two battalions of the brigade received MI officers as Battalion S-2. There has been a marked improvement in collection of information since the MI officers were assigned. They are not only extremely interested in the job but commanders can free infantry officers for use in the rifle companies. It is highly recommended that MI officers be utilized as Battalion S-2 staff officers.

b. (C) XXIV Corps Comments: Recommend military intelligence officers receive additional training in tactical operations, since they are expected to operate closely with the S3 in planning and coordination of intelligence requests for combat operations. Military intelligence officers are at a disadvantage, in this respect, when compared with combat arms officers of like grade and seniority. They have not had the same opportunity for formal or on-the-job training in combat operations.

c. (C) USARPAC Comments: Recommend that selection criteria be reviewed to see if factors can be determined to select MI officers on a basis of retention potential. Career-minded officers who volunteer for transfer to MI from other branches have a definite advantage over recently commissioned ROTC graduates. This experience advantage will serve them well in higher level assignments.

4. (U) USACDC Discussion: None.

5. (U) USACDC Recommendation: That this item be brought to the attention of the DA staff for appropriate action.

CONFIDENTIAL

1. (U) Reference: Operational Report - Lessons Learned, Military Police Group (CI) (PROV), 18 MP Brigade, 31 July 1968.

2. (U) Item: Use of Military Police as Investigators.

3. (U) Unit Comments (Summary):

a. Military policemen without training as investigators are furnished by local provost marshals throughout Vietnam to assist the limited number of accredited and apprentice CID investigators available in-country. These military policemen most frequently have no prior investigative experience. They provide invaluable assistance in handling relatively less serious cases than assigned to trained CID personnel and often are used to assist CID personnel in investigations of major crimes. Training of these military police investigators takes place on the job, often at a considerable cost in terms of CID investigator time and effort. A program should be developed within CONUS to train qualified military policemen for duty as full-time provost marshal investigators and to identify them with an MOS skill digit in the MOS 95B series. Such a program would provide provost marshals with trained personnel for investigations other than those described in paragraph 1-2j, AR 195-10, January 1968.

b. USARPAC Comment: USARPAC expanded on the subject as follows: "This headquarters recognizes that it is not an accepted policy to recognize, per se, a requirement for Provost Marshal investigators. It has been recognized that investigation requirements will occur; consequently, the CID program was developed. Incidents which do not meet the requirements for investigations by CID personnel are to be investigated by Military Police, MOS 95B. Providing MP personnel being assigned to USARV are not sufficiently trained in the facets of military police investigation, then it would be appropriate that the command advise DA of this shortcoming which would then justify an evaluation of the current USACDCMPA training program."

4. (U) USACDC Discussion: Referenced report discusses the training of military policemen in MOS 95B and indicates possible shortcomings in the US Army Military Police School training program. Training and MOS qualifications are USCONARC responsibilities and not those of USACDC Military Police Agency.

5. (U) USACDC Recommendation: That this item be brought to the attention of USCONARC for incorporation into training programs, as appropriate.

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1. (U) Reference: Operational Report - Lessons Learned, 73d Signal Battalion (Spt), 31 July 1968.

2. (U) Item: Generator Failure.

3. (FOUO) Unit Comments: This battalion received 11 new 15 KW generators, 50/60 cycle. Four of these generators had serious malfunctions after running a short period of time. Some would not run at all. The most common fault involved a failure in the actuator assembly. On two of the generators, metal filings or shavings were discovered inside the assembly, apparently left in at the factory. A third generator finally was placed in service after a thorough cleaning of this assembly and careful adjustment and cleaning of the fuel system, especially in the critical jets in the injector system. A fourth generator was evacuated for higher echelon work when the injector pump, overspeed switch, actuator assembly and numerous factory wiring errors were discovered. Several additional generators had "O" ring seal leaks, but this was not a serious problem.

4. (U) USACDC Discussion: The percentage of failure rate for brand-new generators is unacceptable and indicates that acceptance test methods by the US Government should be investigated.

5. (U) USACDC Recommendation: That this item be brought to the attention of AMC for appropriate action.

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1. (U) Reference: Operational Report - Lessons Learned, 10th Transportation Battalion (Tml), 31 July 1968.
2. (U) Item: Protective Mask Inlet Valve Disk.
3. (U) Unit Comments (Summary): The protective mask's inlet valve disk has an unusually high rate of deterioration. During recent CMMI and MRI inspections an extremely high percentage of valve disks in the M-17 masks were found to be unserviceable. When the inlet valve disk has turned yellowish in color it is classified as unserviceable. The deterioration is caused by the climate and prolonged storage of the masks in the M15A1 Carrier. A sufficient quantity of inlet valve disks should be requisitioned and kept on hand to replace unserviceable disks as needed.
4. (U) USACDC Discussion: None.
5. (U) USACDC Recommendation: That this item be brought to the attention of AMC to investigate the deterioration of the valve disks and to review spare parts replacement factors, as appropriate.

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1. (U) Reference: Operational Report - Lessons Learned, 4th Infantry Division, 31 July 1968.
2. (U) Item: Circuit Breakers for Airborne Personnel Detectors.
3. (C) Unit Comments: Fuse wells in Airborne Personnel Detectors are a source of trouble due to lack of replacement fuses. APDs issued to the division should be modified by replacing the fuze wells with circuit breakers.
4. (U) USACDC Discussion: It appears that if the XM-3 is plugged into the aircraft power system with the wrong polarity, the fuse will blow. There is no way of determining the polarity on the aircraft socket. When a circuit breaker is used, the operator merely reverses the plug and throws the circuit breaker back in. The circuit breaker must be properly rated to prevent the power cable on the XM-3 from burning out.
5. (U) USACDC Recommendation: That this item be brought to the attention of AMC for appropriate action.

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1. (U) Reference: Operational Report - Lessons Learned, 4th Infantry Division, 31 July 1965.
2. (U) Item: Fabricated Spray Bar for AGAVENCO System.
3. (C) Unit Comments: An aircraft must fly at speeds in excess of 50 knots to provide enough pressure to open the valves in the AGAVENCO spray system. In the small cultivated fields encountered in the highlands, 50 knots is too fast to provide adequate and effective coverage for crop destruction. A locally fabricated spray bar can be used effectively in crop destruction missions. By replacing the standard spray bar with a 20 foot piece of one inch water pipe drilled with $\frac{1}{8}$ " holes, less pressure is required to operate the system, and the aircraft can fly at 20-30 knots, an acceptable airspeed for crop destruction. The AGAVENCO system with locally fabricated spray bar should be used as the primary crop destruction spray system.
4. (C) USACDC Discussion: The spray boom on the AGRINAUTICS (formerly AGAVENCO) is approximately 12 feet in length. Satisfactory results may be achieved at helicopter speeds slower than 50 knots by utilizing nozzles with orifice diameters of $\frac{1}{4}$ inches which are available. This may preclude fabricating a complete new spray boom.
5. (U) USACDC Recommendation: That this item be brought to the attention of AMC for the purpose of investigating the optimum spray boom nozzle configuration for the helicopter speeds cited in unit comments.

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1. (U) Reference: Operational Report - Lessons Learned, 45th Engineer Group, 31 October 1968.
2. (U) Item: Interservice Supply Support.
3. (U) Unit Comments: Difficulty is being experienced in obtaining Class IV supply support from local U.S. Navy source because of variance in FSN. The reporting unit recommends that Naval Support Activities publish for Army customers, a list of FSN's with a brief description of the item.
4. (U) USACDC Discussion: FSN should be identical throughout all Federal services and agencies. The problem related here may be a matter of local misunderstanding but it merits attention if there is a variance in FSN's. Defense Logistics Service Center has responsibility for assignment of FSN's and cataloging.
5. (U) USACDC Recommendation: That this item be brought to the attention of Defense Logistics Service Center for appropriate action.

1. (U) References:

a. Operational Report - Lessons Learned, 69th Maintenance Battalion (GS), 31 July 1968.

b. Letter, Command Summary - Debriefings of Returnees from Vietnam, HQ USACDC, 29 October 1968. (Page 54)

2. (U) Item: Cabs and Fenders of 5-ton Vehicles.

3. (U) Unit Comments (Summary): Due to the condition of the roads in this area of support, problems have been encountered with cabs and fenders of line-haul vehicles. As the metal rusts, the bolts have a tendency to pull through due to the weight of the extensions and rough roads. As a field fix, several vehicles have $\frac{1}{2}$ " plates welded on the cab where the fender bolts are located and $\frac{3}{8}$ " plates welded at the cab mounting bolt area. This has helped eliminate the problem of right fenders falling off and vehicle cabs shifting during operations.

4. (U) USACDC Discussion: The problem of unsatisfactory fender braces was also reported as an equipment deficiency in reference 1b.

5. (U) USACDC Recommendation: That this item be brought to the attention of AMC for appropriate action.

1. (U) Reference: Operational Report - Lessons Learned, 64th Quartermaster Battalion, 31 July 1968.

2. (U) Item: Cracked Frames on M-52 Series Tractors.

3. (U) Unit Comments:

a. Constant driving on rough unimproved roads seems to be causing a large number of frames to crack on the M52 tractor beneath the fifth wheel. After cracking, the frame can be welded. However, the weld has a lasting effect of about one month and the break cannot be welded the second time thus causing the vehicle to be salvaged. This problem could be possibly solved by "fish plating", a process which reinforces the frame.

b. Other Headquarters' Comments: US Army Support Command, Saigon. New M52 tractors now being received in this command have factory fish plated frames. Installation of frame strengthening kits on 5-ton tractors with cracked frames, during July 1967, proved that the reinforced frame would fail again within 3,000 - 4,000 miles. Since most of the frame failures occur on vehicles with over 25,000 miles, it is not considered feasible to fish plate frames due to the low mileage gained for the effort expended.

4. (U) USACDC Discussion: This is a major recurring item. "Fish plating" after the frames are cracked is not satisfactory. This procedure adds approximately 2-3 months to the frame life. This is a weakness in the frame.

5. (U) USACDC Recommendation: That this item be brought to the attention of AMC for appropriate action.

1. (U) Reference: Operational Report - Lessons Learned, 69th Maintenance Battalion (GS), 31 July 1968.

2. (U) Item: Tailgate Hinge Pins for 2½ ton and 5-ton Cargo Vehicles.

3. (U) Unit Comments: Due to excessive vibration caused by rough roads inherent to this area, many vehicles lose the hinge pins from the vehicle tailgate while on convoy, when the cotter pins vibrate out of the hinge pins. When the hinge pins drop out, there is an increase in vibration in the tailgate, causing cracks in the tailgate itself and resulting in the breaking of the tailgate eyelet. It is recommended that cotter pins be chained to hinge pins as on the ½-ton windshield hinge pins. It is felt that the use of those chains will eliminate the loss of the hinge pins and therefore reduce the service work presently required by these vehicles.

4. (U) USACDC Discussion: None.

5. (U) USACDC Recommendation: That this item be brought to the attention of AMC for appropriate action.

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1. (U) References:

a. Operational Report - Lessons Learned, 6th Battalion, 32d Artillery, 31 July 1968.

b. Operational Report - Lessons Learned, Americal Division, 31 July 1968.

2. (U) Item: Claymore Mines.

3. (C) Unit Comments (Summary): Claymore antipersonnel mines are normally emplaced just prior to darkness and disarmed and stored just after sunrise. Due to the frequent emplacement and removal of the claymore mine, the two thin wires connecting the blasting cap to the firing wire are often broken. It has been found that wrapping tape from the cord to $\frac{1}{4}$ -inch down into the blasting cap prolongs the serviceable life of the claymore mine due to broken wire leads.

4. (C) USACDC Discussion: The unit recommendation of wrapping tape from approximately $\frac{1}{4}$ -inch down into the blasting cap and all the way to the cord is considered a temporary field fix. The application of protective tape to the wire leads prevents the secure attachment of the priming adapter (well cover) to the mine. Mines configured by the temporary field fix of wrapping tape around leads and blasting cap are subject to moisture damage, tampering and neutralization.

5. (U) USACDC Recommendation: That this item be referred to AMC for appropriate action.

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1. (U) Reference: Seminar Report on Bushmaster Operations, I Field Force Vietnam, 15 July 1968. (Pages V, VI)
2. (U) Item: Night Ambush.
3. (FOUO) Unit Comments: An ambush patrol should always operate in its assigned ambush sector during daylight hours to insure familiarization with the terrain where the ambush site is located. Claymore mines should be placed not only to reinforce the killing zone of the ambush, but also to provide 360 degrees of security. Tracer fire at night will compromise a position very quickly.
4. (FOUO) USACDC Discussion: While it is not always possible to operate in an ambush sector during daylight hours, a short aerial reconnaissance with ambush patrol leaders usually conducted late in the day will suffice. A slight increase in schematic detail of the field manual would clarify the claymore mine emplacement. Compromise of position and damage to night observation devices should deter the use of tracer ammunition.
5. (U) USACDC Recommendation: That this item be brought to the attention of USCONARC for incorporation into training programs, as appropriate.

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1. (U) Reference: Operational Report - Lessons Learned, 1st Infantry Division, 31 January 1969.
2. (U) Item: Employment of CS Along Water-Ways.
3. (C) Unit Comments (Summary): A 30 drum CS drop was made to test the XM-925 fuze and burster system. The drop was conducted at 3200 feet and resulted in 4 drums that failed to detonate. Use of the XM-925 system will not be considered for tactical employment without future testing. A request for a CS interdiction line was not authorized for aircraft delivery using drums because of the close proximity of populated areas. As a last resort, the installation of the CS interdiction line by demolition techniques on the ground was considered and accepted as the only means available. Three hundred and ninety-six 8 pound bags of CS-1 were used to contaminate approximately 1800 meters of nipa palm, rice paddies, and stream bank. Method involved 12 bags placed in three rows, four bags per row. Each bag had a single wrap of detonating cord around it and the wrap was tied into a det cord main ring. Each row was separated by 15 meters and each bag was separated by 15 meters. This method was time consuming and the amount of det cord used caused 50 percent of the bags to flash and caused a CS vapor downwind in excess of 5 km. On another occasion, the last 500 meters used four lines of det cord 10-15 meters apart with the bags but 5-10 meters apart. Clouds of persistent CS-1, 50-75 feet high, traveled downwind 300 meters covering the vegetation. US troops 1,000 meters downwind experienced minor irritation for 10 minutes. The latter method proved much faster to emplace. The lesser amount of explosive resulted in less than 3 percent flashing of the CS. Feedback from the tactical commander indicated that the enemy was forced around the interdiction line into our ambushes. Persistent CS can be employed when constraints pertaining to friendly troops, highways, and population exist. It was found that when constraints bar the air drop of persistent CS, it can be emplaced by demolitions techniques in the actual target area. This employment requires transportation, security, and considerable labor. It does, however, reduce airborne effects and can be used in interdictory or denial operations in relatively large targets. The employment of persistent CS by demolition techniques in the actual target area should be considered as the employment technique of choice when constraints bar the use of air drop techniques.
4. (C) USACDC Discussion: The employment of the XM-925 system is discussed in USCONARC publication TC 3-16. The high dud rate of the XM-925 is presently being investigated by the AMC Customer Relations Representative. The CS demolition appears practicable in situations which bar the employment of air-delivered CS. Although it is laborious, this technique can interdict the enemy's movement and channelize him into flank ambushes. The use of CS-2 should make

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this technique even more effective due to increased persistency and reduced flashing.

5. (U) USACDC Recommendation: That this item be considered by USCONARC for incorporation into TC 3-16, as appropriate.

1. (U) Reference: DA Pamphlet No. 350-15-12, Training, Operations - Lessons Learned, 1 January 1969.

2. (U) Item: Use of CS Gas in VC Tunnels.

3. (U) Unit Comments: When checking VC tunnel complexes with CS gas, it is often difficult to get gas to flow through the tunnel. One solution is to throw a CS grenade into the tunnel and follow it with a fragmentation grenade which lands between the CS grenade and the tunnel entrance. The ensuing explosion will cause the gas to be blown through the tunnel complex.

4. (U) USACDC Discussion: Although the above method should be effective in some cases, its effectiveness would be limited if the tunnel system is extensive. When possible, the use of a high capacity blower system, such as the Buffalo Turbine should be considered to force CS throughout the tunnel.

5. (U) USACDC Recommendation: That this item be considered by USCONARC for incorporation into TC 3-16, as appropriate.

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1. (U) Reference: Briefing Scripts to be Delivered at the USARV Command Chemical Conference, 28 Jan 69, 101st Airborne Division (Airmobile). (Incl 2)
2. (U) Item: Persistent CS.
3. (C) Summarized Unit Comments: All drops are made from CH-47 helicopters. The drops are normally made at 1500 feet altitude to burst at 100 feet altitude, and at a speed of 60 knots or less. In deep areas of the Division AO, the altitude is increased to 2500 feet and the length of time fuze extended accordingly. The drums are arranged in parallel rows but dropped individually at one second intervals. This deposits one drum every 50 meters making a line of 1400 meters. To block enemy movement in a defile, three sorties are run parallel to his expected route of egress; one is placed in the valley floor and the others 100-200 meters up each slope. Interdiction missions are run using an average of one to two sorties per valley. On one occasion, during a drop of CS, TAC AIR was called on a group of 20-30 uniformed enemy flushed into the open valley floor by the CS. Periodic refresher drops at two to three week intervals have been called when aerial observation has detected signs of renewed enemy activity. The biggest problem encountered thus far using bulk CS drops has been the unpredictable spread of the agent's effects. In Operation Todd Forrest, CS was used 1500 meters from a landing zone to block enemy movement to the A Shau Valley. The effects of CS were felt on the LZ at the time of insertion.
4. (U) USACDC Discussion: None.
5. (U) USACDC Recommendation: That this item be considered by USCONARC for incorporation into TC 3-16 and that the cited aircraft techniques be considered for incorporation into FM 1-100.

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1. (U) Reference: Operational Report - Lessons Learned, 10th Combat Aviation Battalion, 31 July 1968.

2. (U) Item: Employment of the E-158 Gas Dispenser.

3. (C) Unit Comments (Summary): It has been found that the E-158 gas dispenser activates itself within 50-100 feet of the altitude setting. When this unit is deployed over jungle terrain, most of the gas is released on top of the canopy and has negligible effect. By dropping the canister from an altitude of 100 feet lower than normally required, the canister will penetrate the canopy, explode, and give a good coverage of the target area. Units utilizing the E-158 gas dispenser should incorporate this employment over jungle terrain as standard operating procedure.

4. (C) USACDC Discussion:

a. Indications from other user units are that the mechanical time initiator errs most frequently on the lower side. In these instances, a buffer altitude of 200-300 feet must be added to the altitude in the provisional bombing tables in TM 3-1325-232-12 to avoid duds due to ground impact. By using this technique, functioning of the E-158R2 may be higher than desired but fewer duds will result. Errors on the higher side may be reduced by subtracting a buffer altitude.

b. As ENSURE production of the E-158R2 has been suspended, this munition may be in short supply. The XM-15, which is similar to the E-158R2 except for a modified time fuze, will be available in RVN in the near future. TM 3-1325-231-12 should be consulted when using the XM-15.

c. It is not known if the XM-15 will have the same limitation as that experienced by this unit with the E-158R2. A full evaluation of the XM-15 employed over varying types of terrain is needed to develop bombing tables suitable for effective munition functioning over jungle terrain.

5. (U) USACDC Recommendation: That this item be brought to the attention of AMC for appropriate action.

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1. (U) Reference: Tactical Notes #7, I Field Force Vietnam, November 1968. (Page 97)
2. (U) Item: Clearing Caves with Chemical Munitions.
3. (U) Unit Comments: When cave complexes are encountered that house VC/NVA, it is essential that they be cleared with minimum casualties. An effective way to accomplish clearing is by the use of an E-8 Chemical Dispenser. On one mission 24 M-79 rounds were expended in a cave and fire was still received. The E-8 Chemical Dispenser was then used, and by lowering it through an air vent in the cave and then discharging the dispenser, enough dispersion was provided for the CS to enter the various cave complexes and cause the enemy to displace.
4. (U) USACDC Discussion: This use of the E-8 demonstrates the great versatility of the munition.
5. (U) USACDC Recommendation: That this item be considered by USCONARC for incorporation into TC 3-16, as appropriate.

1. (U) Reference: Tactical Notes #8, I Field Force Vietnam, December 1968. (Page 1)
2. (U) Item: Marking for CS Bulk Drops.
3. (U) Unit Comments: Recent experience has shown that target areas for bulk CS drops may be difficult to locate due to lack of significant terrain features. To reduce expenditure of valuable CH-47 blade time, artillery smoke can be employed on each end of target area. The bulk CS is then dropped between the smoke rounds eliminating lengthy overflights of the target area.
4. (U) USACDC Discussion: The above technique appears to have merit in eliminating drops off target and in reducing CH-47 blade time.
5. (U) USACDC Recommendations: That this item be brought to the attention of USCONARC and considered for incorporation into appropriate training programs and also into the next scheduled change or revision of TC 3-16.

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1. (U) Reference: 101st Airborne Division Chemical Activities Summary - CY 68, 101st Airborne Division (Airmobile). (Page 7)
2. (U) Item: Employment of M4A2 Floating Smoke Pot.
3. (C) Unit Comments: During the initial combat assault, 90 M4A2 Floating Smoke Pots were dropped from 3,200 feet above ground from a CH-47 along 3 sides of an LZ, while the 1/327 Airborne Infantry Battalion assaulted from the open side. The munitions provided an excellent screen and the load capacity of the CH-47 aircraft, coupled with the high employment altitude allowed numerous passes and extended maintenance of the smoke screen. During Operation Somerset Plain screening smoke employed from UH-1 aircraft was used to cover the evacuation of friendly casualties while under hostile fire.
4. (U) USACDC Discussion: The M4A2 Floating Smoke Pots are not designed to be dropped over land. These smoke pots may be seriously damaged if dropped from the cited altitude resulting in numerous duds.
5. (U) USACDC Recommendation: That this item be brought to the attention of USAMC for evaluation of the effectiveness of the M4A2 when dropped over land to include a determination of the dud rate.

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1. (U) Reference: Monthly Chemical Activities Report for February 1969, 1st Cavalry Division (Airmobile). (Page 3)
2. (U) Item: Procedure for Burning Rice.
3. (U) Unit Comments:
 - a. Construct a V trench (or several, depending upon the amount of rice) approximately 10 feet long and 5 feet deep.
 - b. Across this trench, place a crisscrossed layer of logs.
 - c. Place a layer of bamboo matting on the logs.
 - d. Place a layer of rice on the bamboo.
 - e. Place artillery powder bags on the rice.
 - f. Start the bamboo matting and repeat the layers, decreasing the width of the layers each time until a pyramid of bamboo, rice, and powder bags is formed.
 - g. Pour 175 gallons of thickened fuel into the trench through air holes left at each end and ignite.
4. (U) USACDC Discussion: None.
5. (U) USACDC Recommendation: That this item be considered by USCONARC for incorporation into TC 3-16, as appropriate.

1. (U) Reference: Monthly Chemical Activities Report for November 1968, 1st Cavalry Division (Airmobile). (Pages 2,3)

2. (U) Item: Chemical Operations.

3. (U) Unit Comments (Summary): This Division has experienced problems trying to meet the criteria of service life of the M8 hoses. Each hose is supposed to have a date of manufacture and date of depot issue stamped on it. The M8 hose cannot be more than 5 years old from date of manufacture or more than 2 years old from the date of issue. In November 1968, 35 out of 100 hoses received did not meet the service life criteria. Non-availability of serviceable M8 hoses has been reducing the firepower of this Division.

4. (U) USACDC Discussion: None.

5. (U) USACDC Recommendation: That this item be referred to AMC for appropriate action regarding the non-availability of serviceable M8 hoses.

ACRONYMS AND SIMILAR TERMS

ACN	- Action Control Number
ACoS	- Assistant Chief of Staff
ACSFOR	- Assistant Chief of Staff for Force Development
ACTIV	- Army Combat Team in Vietnam
AHC	- Assault Helicopter Company
AMBL	- Airmobile
AMC	- Army Materiel Command
AO	- Area of Operations
AORTA	- Aviation Organizational Requirements for the Army
APD	- Airborne Personnel Detector
AR	- Army Regulation
ARA	- Aerial Artillery (Derived from phrase, "Aerial Rocket Artillery")
ARCSA	- Aviation Requirements for the Combat Structure of the Army
ARVN	- Army of the Republic of Vietnam
AW	- Automatic Weapons
BIC	- Battlefield Information Center
BICC	- Battle Information and Control Center
BOIP	- Basis of Issue Plan
CAAS-75	- Combined Arms and Support - 1975
CDOG	- Combat Development Objectives Guide
CIDG	- Civilian Irregular Defense Group
CMMI	- Command Maintenance Management Inspection
CONARC	- Continental Army Command

CONUS	- Continental United States
CS	- A Riot Control Agent
CS3	- The Combat Service Support System
CSF	- Camp Strike Force
DA	- Department of the Army
DISCOM	- Division Support Command
EM	- Enlisted Man
ENSURE	- Expedited Nonstandard Urgent Requirement for Equipment
FAC	- Forward Air Controller
FM	- Field Manual
FM	- Frequency Modulated
FSB	- Fire Support Base
FSE	- Fire Support Element
FSN	- Federal Stock Number
FY	- Fiscal Year
GS	- General Support
H&I	- Harassing and Interdiction
HE	- High Explosive
IFFV	- First Field Force Vietnam
JCS	- Joint Chiefs of Staff
LP	- Limited Production
LRP	- Long Range Patrol
LR-QR	- Letter Requirement - Quick Reaction
LRRP	- Long Range Reconnaissance Patrol
LZ	- Landing Zone

MACRIT	- Manpower Authorization Standards and Criteria
MACV	- Military Assistance Command, Vietnam
MEDCAP	- Medical Civic Action Program
MG	- Machinegun
MHE	- Material Handling Equipment
MI	- Military Intelligence
MILSTRIP	- Military Standard Requisitioning and Issue Procedures
MOS	- Military Occupational Specialty
MP	- Military Police
MRI	- Materiel Readiness Inspection
MTEL	- Manning Table and Equipment List
MTOE	- Modified Table of Organization and Equipment
MWO	- Modification Work Order
NCOIC	- Noncommissioned Officer in Charge
NVA	- North Vietnamese Army
OCS	- Officer Candidate School
OIC	- Officer in Charge
OJT	- On the Job Training
POI	- Programs of Instruction
PSP	- Pierced Steel Planking
PSYOP	- Psychological Operation
PROV	- Provisional
PZ	- Pick-up Zone
QMDO	- Qualitative Materiel Development Objective
QMR	- Qualitative Materiel Requirement

RCA	- Riot Control Agent
RDD	- Required Delivery Date
ROTC	- Reserve Officers' Training Corps
RVN	- Republic of Vietnam
S&P	- Stake and Platform
SDR	- Small Development Requirement
SOP	- Standard Operating Procedure
TAC Air	- Tactical Air
TACOM	- Field Army Requirements for Tactical Communications
TAG	- The Adjutant General
TARS-75	- Tactical Reconnaissance and Surveillance - 1975
TASTA-70	- The Administrative Support, Theater Army - 1970
TC	- Training Circular
TIIF	- Tactical Imagery Interpretation Facility
TIPL	- Tactical Imagery Processing Laboratory
TM	- Technical Manual
TOE	- Table of Organization and Equipment
UHF	- Ultra High Frequency
USACDC	- United States Army Combat Developments Command
USACDCMPA	- United States Army Combat Developments Command Military Police Agency
USAF	- United States Air Force
USAMERDC	- United States Army Mobility Equipment Research and Development Center
USARPAC	- United States Army, Pacific
USARV	- United States Army, Vietnam

USATSCH - United States Army Transportation School
USCONARC - United States Continental Army Command
VC - Viet Cong
VHF - Very High Frequency
WP - White Phosphorous